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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,981	07/31/2001	Ruben Martinez	P30628US	3818
7590 03/12/2004			EXAMINER	
E. EUGENE THIGPEN PETROLEUM GEO-SERVICES, INC. P.O. BOX 42805 HOUSTON, TX 77242-2805			TAYLOR, VICTOR J	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/918,981

Applicant(s)

MARTINEZ ET AL.

Examiner

Victor J. Taylor

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aw

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☒ Claim(s) 1, 8, 14, 17, 29, 47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Office Action.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show all the means required for the system claims for migrating seismic data as found in claims 29-46 and as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. Corrections and clarification are required

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because it consists of three paragraphs and is not of the single paragraph form and is too long and is in improper form. Correction is required. See MPEP § 608.01(b).

4. Claims 1, 29, and 47 are objected to because of the following informalities:

The preamble defines a method and system for migrating seismic data in claims 1 and 29 and producing a seismic data by/product in claim 47 with the claim limitations drawn in the independent claims for "outputting data" which could comprises any output data or any data product as found in the art. Appropriate correction is required.

5. Claims 1, 29, and 47 are objected to because of the following informalities:

The term "ray-bending" correction is not clear as to just what comprises this "ray-bending". Snell's law and point of diffraction to an angle of incidence as the angle between a particular ray and the normal perpendicular to a particular interface as found in lines 40-45 of column 6 in US 4,967,401 of the cited art indicates an angle boundary reflection between different boundary materials. Appropriate correction is required.

6. Claims 8, 14, and 17 are objected to because of the following informalities:

The claims have sentences with missing ending periods and semi-colons with improper ending after the equation that require correcting. Corrections are required.

7. Claim 47 is objected to because of the following informalities:

Claim 47 is directed to a product by process, see the MPEP in chapter 21 and in section 2173.05 wherein the claim limitations are directed to the process of "outputting data", see the product by process section 2173.05(p). The preamble has no transitions

phrase to the seismic method and it is not clear whether the claim is directed to the seismic product by seismic process or seismic method.

A product-by-process claim, which is a product claim that defines the claimed product in terms of the process by which it is made, is proper. As reference to "In re Luck, 476 F.2d 650, 177 USPQ 523 (CCPA 1973)"; and "In re Pilkington, 411 F.2d 1345, 162 USPQ 145 (CCPA 1969)"; and "In re Steppan, 394 F.2d 1013, 156 USPQ 143 (CCPA 1967)" case history.

A claim to a device, apparatus, manufacture, or composition of matter may contain a reference to the process in which it is intended to be used without being objectionable under 35 U.S.C. 112, second paragraph, so long as it is clear that the claim is directed to the product and not the process. An applicant may present claims of varying scope even if it is necessary to describe the claimed product in product-by-process terms. See *Ex parte Pantzer* in 176 USPQ 141 (Bd. App. 1972).

The examiner recommends corrections to the "seismic data method" with the steps of "outputting seismic data". Appropriate correction is required

Prior Art

8. The prior art of record and not relied upon and is considered pertinent to the applicant as follows:

I. Thomsen US 6,292,754 in class 702/014 is cited for the elements of determining a travel time and determining a ray bending correction and determining an amplitude correction and out-putting data in lines 1-35 of the abstract in combination

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with the multi component data in lines 45-65 of column 6 in combination with the complete patent

II. Thomsen US 6,128,580 in class 702/018 is cited for the elements of determining a travel time and determining a ray bending correction and determining an amplitude correction and out-putting data in figure 1-B and in lines 25-60 of column 6 in combination with the equations found in columns 9-26.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Barney in US 4,967,401.

With regard to claims 1 and 29 Barney discloses the limitation of,

- a. Determining the travel time in step-e of figure 11-A and,
- b. Further discloses the limitation of determining a ray-bending correction in the step of determining the reflective coefficients in step-g, see the reflected ray in figure 3 and in lines 43-50 of column 6 and,
- c. Further discloses the limitation of determining the amplitude correction in the static and dynamic correction to the ray midpoint gather in step-c of figure 11-a and,

d. Further discloses the outputting data based on the disclosed above limitations and displaying amplitude corrections in step-f in figure 3.

In addition Barnet discloses the computer system and modeling system providing the means for migrating seismic data in the central processing unit of figure 12 in combination with the equation processing of seismic data in lines 18-50 of column 5.

As to claims 2 and 30 Barnet discloses the limitation and means of restoring essentially true amplitude in the corrected amplitude in lines 41-50 of column 5.

As to claim 3 and 31 Barnet discloses the limitation and means of angle dependent coefficients in line 27 of column 9.

As to claims 4 and 32 Barnet discloses the limitation and means of geometrical spreading factor in the Zoeppritz equations and the forward modeling in line 52 of column 9.

As to claims 5 and 33 Barnet discloses the limitation and means of determining amplitude weights as seismic wave corrections and correct offset amplitude variations determined by reflective functions and offset weighting in lines 42-52 of column 5.

As to claim 6 Barnet discloses the limitation of amplitude weights dependent on travel time by convoluting the source wavelet with the reflection coefficient series in line 40 of column 6.

As to claim 7 Barnet discloses the limitation of takeoff and emergence angles in figure 3.

As to claims 8, 9, 10, 13, 14, and 17 Barnet discloses the limitation of expressed equations as the routine transform matter determined from known expressions such as

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the Snells equations in line 16 of column 10 with the equations found in columns 10-13 and examples of Bortfeld and Zoeppritz equations found in line 30 of column 9.

As to claims 11 and 34 Barnet discloses the limitation and means of determining a velocity profile as the ray parameter p for the velocity of a particular ray in line 25 of column 7 and determines a velocity profile in the central processing unit of figure 12 in combination with the process in lines 18-50 of column 5.

As to claims 12 and 35 Barnet discloses the limitation and means of midpoint in the common midpoint in line 54 of column 6 and determines the midpoint between the differences in the travel times in line 12 of column 7.

As to claim 15 Barnet discloses the limitation of determining a travel time for small offset to depth ratios in the lithological parameters in line 30 of column 5 with the time indexing in line 15 of column 8 to produce stacking line 5 and discloses small reflective coefficients in figure 7.

As to claim 16 Barnet discloses the limitation of a large offset ratio as offset set X in line 15 of column 7 and a series in figure 4 to figure 7.

As to claims 18 and 36 Barnet discloses the limitation and means of ray tracing in the path of the ray in down to up direction in lines 20-26 variable with $\sin \theta$ of reflection in column 7.

As to claims 19 and 37 Barnet discloses the limitation and means of determining the travel time in reflective coefficients in line 32 of column 7.

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As to claims 20 and 38 Barnet discloses the limitation and means of vertical symmetry axis "VTI" in the stacking of seismic traces in figure 14 and in line 65 of column 15.

As to claims 21 and 39 Barnet discloses the limitation and means of determining a time table to calculate the output imaging time as found in the computer and timer for imaging in line 32 of column 13 and disclosed in the color graphics unit of figure 12.

As to claims 22 and 40 Barnet discloses the limitation and means of output gather modes in step l of figure 11-b for each gather group.

As to claims 23 and 41 Barnet discloses the limitation and means of outputting data in non-gather modes in estimated lithology and displaying sections step k of figure 11-b.

As to claims 24 and 42 Barnet discloses the limitation and means of determining a vertical symmetry axis "VTI" in the stacking of seismic traces in figure 14 and in line 65 of column 1.

As to claims 25 and 43 Barnet discloses the limitation and means of determining an offset midpoint travel time in the CPU and array processor in figure 12.

As to claims 26 and 44 Barnet discloses the limitation and means of determining a migration velocity in the velocity $v(t)$ step h of figure 11-b, and discloses determining the anisotropy parameter in the density $p(t)$ of step h in figure 11-b.

As to claims 27 and 45 Barnet discloses the limitation and means of anti-alias filtering as data sorting in step b of figure 11-a.

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As to claims 28 and 46 Barnet discloses the limitation and means of determining a number of processors required to hold target bins in the control unit of the central processing unit in figure 12 and discloses the stacking and sorting in lines 1-10 of column 8 with the side by side binning display of a sequenced of adjacent stacked traces in line 4 of column 8.

With regard to claim 47, which is directed to a product by process, see MPEP in chapter 21 and section 2173.05 wherein the claim limitations are directed to the process of "outputting data", see section 2173.05(p).

Barnet further discloses this output data in step l, and step k and step n of figure 11-b. It would be obvious to produce this data product as indicated in figure 11-A. In addition Barnet discloses the limitations as discussed above of determining the travel time in step-e of figure 11-A, and further discloses the limitation of determining a ray-bending correction in the step of determining the reflective coefficients in step-g, see the reflected ray in figure 3 and in lines 43-50 of column 6, and further discloses the limitation of determining the amplitude correction in the static and dynamic correction to the ray midpoint gather in step-c of figure 11-a, and further discloses the outputting data based on the disclosed above limitations and displaying corrections in step-f in figure 3.

In addition Barnet discloses the limitation of displaying the product of the corrected lithological sections in step-p of figure 11-B and in combination with lines 15-50 of column 5 and lines 35-65 of column 6 and in combination with the equations found in columns 10-13.

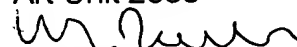
Conclusion


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-2281.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Victor J. Taylor
Examiner
Art Unit 2863


8 February 2004


John Barlow
Supervisory Patent Examiner
Technology Center 2800